FIELD TASK - STATEMENT OF WORK #1

Direct-Push Ground Water Sampling off the EMD Chemicals Inc. Facility

EMD CHEMICALS INC.
CINCINNATI, OHIO

Project No. 100.58.19

EPA ID No. OHD 086 438 538

August 4, 2004

Prepared For

EMD CHEMICALS INC.
2909 Highland Avenue
Cincinnati, Ohio 45212

Prepared By

THE PAYNE FIRM, INC.
11231 Cornell Park Drive
Cincinnati, Ohio 45242
1-800-229-1443 Fax: 513-489-2533

DRAFT

FIELD TASK - STATEMENT OF WORK #1

Direct-Push Ground Water Sampling off the EMD Chemicals Inc. Facility

EMD CHEMICALS INC.
CINCINNATI, OHIO

Project No. 100.58.19

EPA ID No. OHD 086 438 538

August 4, 2004

Angela L. Hurley
Project Field Coordinator

Kevin D. Kallini, P.G.
Project Manager

Prepared For

EMD CHEMICALS INC.
2909 Highland Avenue
Cincinnati, Ohio 45212

Prepared By

THE PAYNE FIRM, INC.
11231 Cornell Park Drive
Cincinnati, Ohio 45242
1-800-229-1443 Fax: 513-489-2533

DRAFT

FIELD TASK
STATEMENT OF WORK #1

The Payne Firm, Inc.
Environmental Consultants

11231 Cornell Park Drive
Cincinnati, Ohio 45242
513-489-2255 Fax: 513-489-2533

DATE: August 5, 2004

SUBJECT: Direct-Push Ground Water Sampling off the EMD Chemicals Inc. Facility

PROJECT NO.: 100.58.19

---

1. OBJECTIVES

This Field Task Statement of Work (SOW) identifies the first task that will be undertaken as part of a July 28, 2004 RCRA Voluntary Corrective Action Agreement (Agreement) between EMD Chemicals Inc., located at 2909 Highland Avenue, Cincinnati, Ohio (Facility), and the United States Environmental Protection Agency (US EPA).

This SOW includes the installation of Direct-Push borings to obtain water samples off of the Facility. The main objective of the Direct-Push water sampling is to collect sufficient data needed to make the appropriate determinations required by the RCRA Ground Water Environmental Indicators (CA750) and to assist in the location of potential additional monitoring well locations. As shown on Figure 1, work will be performed within portions of the ODOT Right-of-Way along Interstate 71 and State Route 562.

Sample collection (Table 1), quality assurance/quality control procedures, employment of data quality objectives, and containment of drilling waste will be coordinated by a Payne Firm geologist in accordance with the Payne Firm's SOPs and project-specific Quality Assurance Project Plan (QAPP). Relevant Tables and Appendices from the QAPP are included with this SOW.

2. WORK TO BE COMPLETED

A. Off Property Direct-Push Ground Water Sampling

Ground water samples will be collected from saturated intervals within the fill and/or Lower Clay Unit at the locations shown on Figure 1. This investigation will consist of utilizing a Direct-Push Geoprobe® rig to complete borings into the Lower Till Unit which will be logged by a Payne Firm geologist. Once the Lower Till Unit is encountered, the hole will be abandoned to the ground surface in accordance with state guidelines. Additionally, if a saturated interval is identified from logging, a new boring will be offset to collect a ground water sample from this saturated interval. The ground water samples will be analyzed for volatile organic compounds (VOCs)

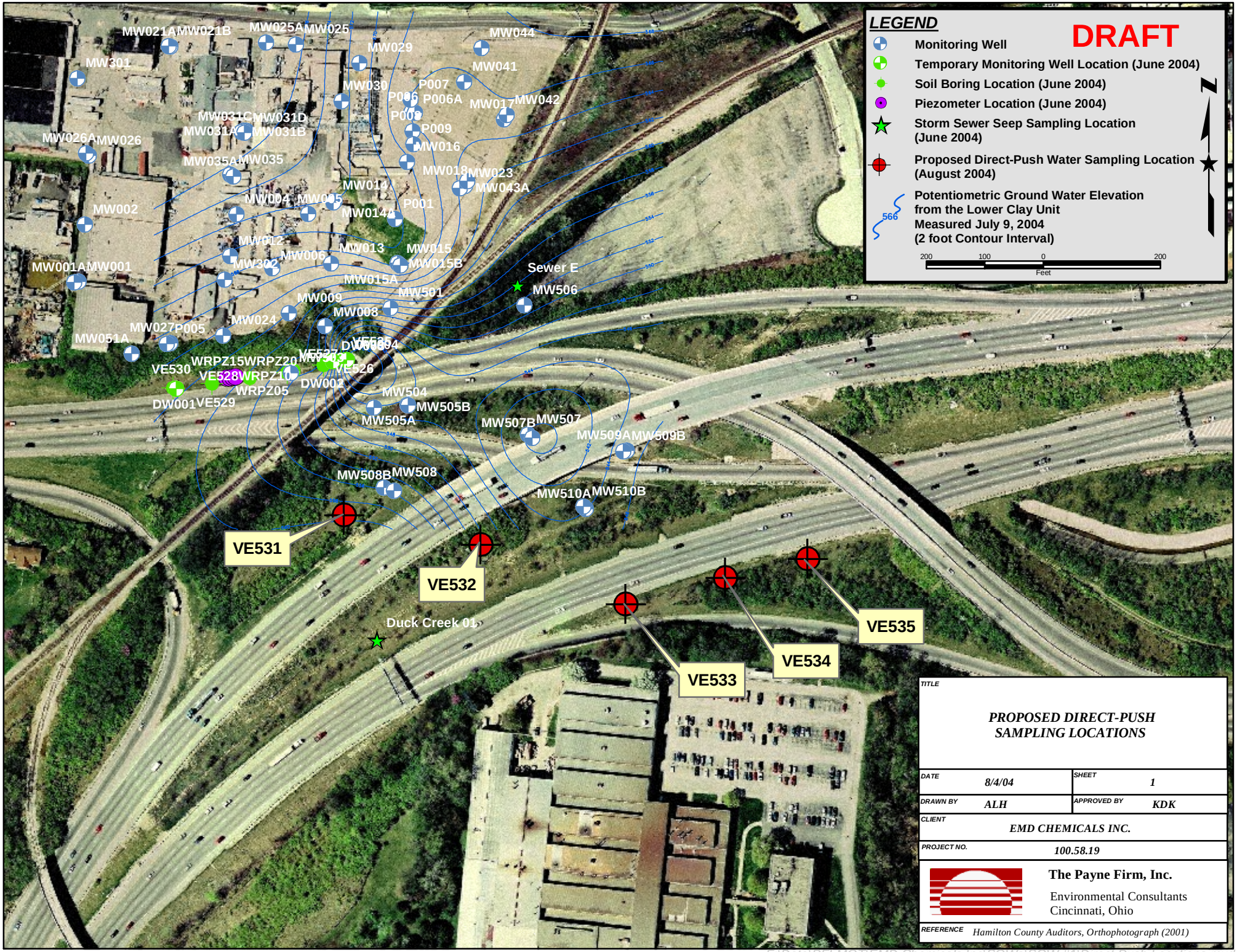
in order to determine the potential need for additional monitoring wells. Results from this investigation will yield information for potential monitoring well placement into the fill and/or Lower Clay Unit during 2004.

Upon completion, a licensed surveyor will locate the coordinates and elevations of the Direct-Push borings. Validated analytical laboratory data will be provided in quarterly progress reports to the US EPA.

3. PROJECT TEAM

Dan D. Weed, C.P.G. (Principal)
Kevin D. Kallini, P.G., Staff Geologist (Project Manager)
Angela L. Hurley, Staff Geologist (Project Field Coordinator)

FIGURES


LEGEND
DRAFT
Monitoring Well
Temporary Monitoring Well Location (June 2004)
Soil Boring Location (June 2004)
Piezometer Location (June 2004)
Storm Sewer Seep Sampling Location (June 2004)
Proposed Direct-Push Water Sampling Location (August 2004)
Potentiometric Ground Water Elevation from the Lower Clay Unit Measured July 9, 2004 (2 foot Contour Interval)
566
200 100 0 200
Feet
N
MW021A MW021B MW025A MW025 MW029 MW044 MW301 MW041 MW030 P007 P006 P006A MW017 MW042 MW031C MW031D MW031A MW031B P008 P009 MW026A MW026 MW016 MW035A MW035 MW018 MW023 MW043A MW014 MW004 MW005 P001 MW014A MW002 MW012 MW013 MW015 MW006 MW015B MW001A MW001 MW003 Sewer E MW015A MW501 MW506 MW009 MW008 MW024 MW027 P005 MW051A VE535 DW003 VE527 WRPZ15 WRPZ20 VE530 VE526 VE528 WRPZ10 DW002 WRPZ05 DW001 VE529 MW504 MW505B MW505A MW507B MW507 MW509A MW509B MW508B MW508 MW510A MW510B VE531 VE532 Duck Creek 01 VE533 VE534 VE535
TITLE
PROPOSED DIRECT-PUSH SAMPLING LOCATIONS
DATE 8/4/04
SHEET 1
DRAWN BY ALH
APPROVED BY KDK
CLIENT EMD CHEMICALS INC.
PROJECT NO. 100.58.19
The Payne Firm, Inc.
Environmental Consultants
Cincinnati, Ohio
REFERENCE Hamilton County Auditors, Orthophotograph (2001)
F:\Data\PFI-MGT\EMD Chemicals Inc\SOWs\SOW #1\Direct Push Locations.mxd

TABLES

The Payne Firm, Inc.

EMD Chemicals Inc.
2909 Highland Avenue
Cincinnati, Ohio
Project No. 100.5R.19

TABLE 1: SOW #1 Sampling Information

Sample Order Hierarchy	Location	ID Location	Field Sample ID	US EPA RCRA SW-846		Sample Containers		Field Preservative	Holding Times	QA/QC Samples	
				Analytical Method	Preparation Method	Number	Type			Type	Sample ID
				Water	Water						
1	West side of I-71 Southbound	VE531	VE531/LOWER DEPTH/DATE	VOCs 8260B	VOCs 5030B	3	VOCs-40 mL glass VOA in triplicate	Ice; HCl	14-Days (VOCs)	NA	NA
2	West side of I-71 Southbound	VE531	VE531/MIDDLE DEPTH/DATE	VOCs 8260B	VOCs 5030B	3	VOCs-40 mL glass VOA in triplicate	Ice; HCl	14-Days (VOCs)	NA	NA
3	West side of I-71 Southbound	VE531	VE531/UPPER DEPTH/DATE	VOCs 8260B	VOCs 5030B	3	VOCs-40 mL glass VOA in triplicate	Ice; HCl	14-Days (VOCs)	NA	NA
4	East side of I-71 Southbound	VE532	VE532/LOWER DEPTH/DATE	VOCs 8260B	VOCs 5030B	3	VOCs-40 mL glass VOA in triplicate	Ice; HCl	14-Days (VOCs)	NA	NA
5	East side of I-71 Southbound	VE532	VE532/MIDDLE DEPTH/DATE	VOCs 8260B	VOCs 5030B	3	VOCs-40 mL glass VOA in triplicate	Ice; HCl	14-Days (VOCs)	NA	NA
6	East side of I-71 Southbound	VE532	VE532/UPPER DEPTH/DATE	VOCs 8260B	VOCs 5030B	3	VOCs-40 mL glass VOA in triplicate	Ice; HCl	14-Days (VOCs)	NA	NA
7	East side of I-71 Northbound	VE533	VE533/LOWER DEPTH/DATE	VOCs 8260B	VOCs 5030B	3	VOCs-40 mL glass VOA in triplicate	Ice; HCl	14-Days (VOCs)	NA	NA
8	East side of I-71 Northbound	VE533	VE533/MIDDLE DEPTH/DATE	VOCs 8260B	VOCs 5030B	3	VOCs-40 mL glass VOA in triplicate	Ice; HCl	14-Days (VOCs)	NA	NA
9	East side of I-71 Northbound	VE533	VE533/UPPER DEPTH/DATE	VOCs 8260B	VOCs 5030B	3	VOCs-40 mL glass VOA in triplicate	Ice; HCl	14-Days (VOCs)	NA	NA
10	East side of I-71 Northbound	VE534	VE534/LOWER DEPTH/DATE	VOCs 8260B	VOCs 5030B	3	VOCs-40 mL glass VOA in triplicate	Ice; HCl	14-Days (VOCs)	NA	NA
11	East side of I-71 Northbound	VE534	VE534/MIDDLE DEPTH/DATE	VOCs 8260B	VOCs 5030B	3	VOCs-40 mL glass VOA in triplicate	Ice; HCl	14-Days (VOCs)	NA	NA
12	East side of I-71 Northbound	VE534	VE534/UPPER DEPTH/DATE	VOCs 8260B	VOCs 5030B	3	VOCs-40 mL glass VOA in triplicate	Ice; HCl	14-Days (VOCs)	NA	NA
				VOCs 8260B	VOCs 5030B	3	VOCs-40 mL glass VOA in triplicate	Ice; HCl	14-Days (VOCs)	DUPLICATE	DUP-001/[DATE]
				VOCs 8260B	VOCs 5030B	3	VOCs-40 mL glass VOA in triplicate	Ice; HCl	14-Days (VOCs)	MS	VE534/UPPER DEPTH/DATE
				VOCs 8260B	VOCs 5030B	3	VOCs-40 mL glass VOA in triplicate	Ice; HCl	14-Days (VOCs)	MSD	VE534/UPPER DEPTH/DATE
13	East side of I-71 Northbound	VE535	VE535/LOWER DEPTH/DATE	VOCs 8260B	VOCs 5030B	3	VOCs-40 mL glass VOA in triplicate	Ice; HCl	14-Days (VOCs)	NA	NA
14	East side of I-71 Northbound	VE535	VE535/MIDDLE DEPTH/DATE	VOCs 8260B	VOCs 5030B	3	VOCs-40 mL glass VOA in triplicate	Ice; HCl	14-Days (VOCs)	NA	NA
15	East side of I-71 Northbound	VE535	VE535/UPPER DEPTH/DATE	VOCs 8260B	VOCs 5030B	3	VOCs-40 mL glass VOA in triplicate	Ice; HCl	14-Days (VOCs)	NA	NA
OTHER QA/QC SAMPLES FOR WATER GEOPROBES				VOCs 8260B	VOCs 5030B	2	VOCs-40 mL glass VOA in duplicate	Ice; HCl	14-Days (VOCs)	1 Trip Blank per Cooler	TRIP BLANK/DATE
				VOCs 8260B	VOCs 5030B	3	VOCs-40 mL glass VOA in triplicate	Ice; HCl	14-Days (VOCs)	1 Field Blank	FIELD BLANK/DATE
				VOCs 8260B	VOCs 5030B	3	VOCs-40 mL glass VOA in triplicate	Ice; HCl	14-Days (VOCs)	1 Equipment Rinsate	RINSATE/DATE

NOTES:
MS = Matrix Spike
MSD = Matrix Spike Duplicate
QA/QC Samples

The Payne Firm, Inc.

EMD Chemicals Inc.

2909 Highland Avenue

Cincinnati, Ohio

Project No. 100.58.19

Data Objective Summary Form (SOW #1: Direct-Push Ground Water Sampling off the EMD Chemicals Inc. Facility)

Activity:	Direct-Push Ground Water Sampling off the EMD Chemicals Inc. Facility	**# VOCs Water**	**# 40-ml VOAs**
Sample Media:	Water		
Sample Type:	Grab		
Number of Samples	15 Investigative Samples	15	45
QA/QC Samples:	1 Field Duplicate per 20 samples	1	3
	1 MS/MSD per 20 samples	2	6
	1 Trip Blank with every cooler for VOC analysis	1	3
	1 Field Blank per 20 samples	1	3
	1 Equipment Rinsate per 20 samples	1	3
Sampling Procedures:	See applicable SOPs attached to QAPP		
Analytical Methods:	SW-846 VOCs-8260		
Appropriate Analytical Support Levels:	ASL-IV Data Package		
	Totals	21	63

DRAFT

EMD Chemicals Inc.
Norwood, Ohio
Project No. 0100.58.19

The Payne Firm, Inc.
Environmental Consultants

TABLE 7: Sample Containers, Preservatives, and Holding Times

Analytical Parameters	Matrix	Minimum Sample Size[1]	RCRA (SW846)[2, 3]		
			Analytical Method	Sample Preparation Method	Requirements
VOCs	Water	40 mL	8260B	SW-846 5030B	40 mL glass, VOA vial (in triplicate) with Teflon®-lined septa without headspace, Cool, 4° C, Add sodium thiosulfate if residual chlorine, 1:1 HCl to pH £ 2, 14 days with pH £ 2
	Solid[4]	5 g or 25 g	8260B	SW-846 5035	4 or 8 oz glass with Teflon®-lined lid, Cool 4° C, 14 days. Field preserved with sodium bisulfate solution for low level analysis, or with methanol for medium level analysis. Soil sample can also be taken by using three EnCore™ samplers and preserved in the laboratory within 48 hours of sampling. Maximum holding time for Encore Sampler is 48 hours (before the sample is added to methanol or sodium bisulfate). Cool, 4° C[5]
SVOCS	Solid	50 g	SW-846 8270C	SW-846 3550B	4 oz. glass wide mouth with Teflon-lined lid, cool, 4° C, Extraction within 14 days of sample collection, and analysis within 40 days of extraction.
	Water	1000 ml	SW-846 8270C	SW-846 3520C	2X1 liter amber glass with Teflon-lined lid, cool to 4°C, extraction within 7 days of sample collection, and analysis within 40 days of extraction.
Metals[6]	Solid	50 g	SW846-6010B	SW846-3050B	4 oz. glass jar at 4°C, holding time 6 months after sample collection.
	Water	500 ml	SW846-6010B	SW846-3005A	500 mL plastic bottle preserved with HNO3 to pH<2, holding time 6 months after sample collection.
TOC	Solid				

1 = Minimum sample size indicates sample amount needed for a single analysis. Matrix spikes or duplicates will require an additional sample amount of at least this amount for each additional QC sample aliquot required.

2 = Holding times are calculated from the date of collection.

3 = Resource Conservation and Recovery Act, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, Third Edition, September 1986. Contains Final Update I (July 1992), Final Update IIA (August 1993), Final Update II (September 1994), Final Update IIB (January 1995), and Final Update III (December 1996).

4 = Solid matrix type includes soil, sediment, sludge or other solids not classified as waste.

5 = Depending on regulatory programs, EnCore™ samplers may be preserved for up to 14 days from sampling by freezing at -5 to -12° C until analysis. Alternatively the EnCore™ sample may be transferred to a 40-ml VOA vial and preserved by freezing at -5 to -12° C until analysis. Some regulatory agencies may require 4 or 8 oz glass with Teflon®-lined lid, Cool 4° C, 14 days. This technique is not recommended, but will be supported where required. (Preservation and holding times are subject to client specifications.)

6 = Arsenic, chromium, and nickel.

EMD Chemicals Inc.
Norwood, Ohio
Project No. 0100.58.19

The Payne Firm, Inc.
Environmental Consultants

TABLE 8: List of Field Standard Operating Procedures

Field Procedure	The Payne Firm SOP Number[1]
Field Log Books	1-1
Labeling and Custody	1-3
Packaging and Shipping	1-4
Hazard Recognition	1-5
Restoration of Work Site	1-7
Land or Elevation Survey	1-8
Water Level Measurements	2-5
Turbidity Measurements	2-7
Measurement of Specific Conductance and pH	2-9
Measurement of Temperature	2-10
Collection of an Air Sample	2-11
Use of Toxic Vapor Analyzers	2-14
Decontamination of Drilling Equipment	3-1
Observation of Hollow Stem Auger Drilling Activities	3-2
Borehole Logging	3-5
Borehole Abandonment	3-6
Observation of Rotasonic Drilling Activities	3-7
Installation of Monitoring Wells	4-2
Well Abandonment	4-4
Decontamination of Soil Sampling Equipment	5-1
Soil Sampling	5-2
Soil Headspace Organic (HSO) Field Screening	5-3
Decontamination of Water Sampling Equipment	6-1
Well Development	6-2
Well Purging	6-3
Ground Water Sampling	6-4
Field Filtration of Ground Water Samples	6-6
Project Management	8-1
Data Validation	8-2

[1] SOPs are located in Appendix II.

EMD Chemicals Inc.
Norwood, Ohio
Project No. 0100.58.19

The Payne Firm, Inc.
Environmental Consultants

TABLE 10: Summary of Analytical Methods

Parameter Group	Water	Solid	Sample Preparation Method	
			Water	Solid
Appendix IX Volatile Organic Compounds	SW-846 8260B	SW-846 8260B	SW-846 5030B	SW-846 5035
Appendix IX Semi-Volatile Organic Compounds (Modified)	SW-846 8270C	SW-846 8270C	SW-846 3520C	SW-846 3550B
Metals	SW-846 6010B	SW-846 6010B	SW-846 3005A	SW-846 3050B
Total Organic Carbon	NA	SW-846 9060	NA	NA
Geotechnical Engineering Properties				
Grain Size	NA	ASTM D422	NA	NA
Unit Weight, Porosity, Void Ratio, Degree of Saturation	NA	ACOE	NA	NA
Moisture Content	NA	ASTM D2216	NA	NA
Specific Gravity	NA	ASTM D854	NA	NA
Atterberg Limits	NA	ASTM D4318	NA	NA
Permeability (Undistributed)	NA	ASTM D5084	NA	NA
Permeability (Distributed)	NA	ASTM D2487	NA	NA
Unified Soil Classification System (USCS)	NA	ASTM D2434	NA	NA
Waste Characterization				
VOC TCLP	NA	SW-846 8260B	NA	SW-846 5035
SVOC TCLP	NA	SW-846 8220C	NA	SW-846 3550
Metals TCLP	NA	SW-846 6010B	NA	SW-846 3050B
Pesticides TCLP	NA	SW-846 8081A	NA	
Herbicides TCLP	NA	SW-846 8151A	NA	
Polychlorinated Biphenyls TCLP	NA	SW-846 8082	NA	
Corrosivity	NA	SW-846 9045C	NA	

DRAFT

TABLE 10: Summary of Analytical Methods

Parameter Group	Water	Solid	Sample Preparation Method	
			Water	Solid
Ignitability	NA	SW-846 1010	NA	
Reactive Cyanide	NA	SW-846 7.3.3	NA	
Reactive Sulfide	NA	SW-846 7.3.4	NA	
Total % Solids	NA	MCAWW 160.3 MOP	NA	

NA = Not Applicable.
SW-846 = "Test Methods for Evaluating Solid Waste, Physical/Chemical Methods," EPA SW-846, 3rd Edition
ASTM = American Society for Testing Materials
ACOC = "Laboratory Soil Testing," Army Corps of Engineers, EM 1110-2-1906, November 30, 1970.
MCAWW = Method for Chemical Analysis of Water and Waste